

Abstract

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Climate Scenarios for the NASA / USAID SERVIR Project: Challenges for Multiple Planning Horizons

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SERVIR, an acronym meaning “to serve” in Spanish, is a joint venture between NASA and the U.S. Agency for International Development (USAID) which provides satellite-based Earth observation data, modeling, and science applications to help developing nations in Central America, East Africa and the Himalayas improve environmental decision making. Anticipating climate variability / climate change impacts has now become an important component of the SERVIR efforts to build capacity in these regions. Uncertainty in hydrometeorological components of climate variations and exposure to extreme events across scales from weather to climate are of particular concern.

We report here on work to construct scenarios or outlooks that are being developed as input drivers for decision support systems (DSSs) in a variety of settings. These DSSs are being developed jointly by a broad array NASA Applied Science Team (AST) Investigations and user communities in the three SERVIR Hub Regions, Central America, East Africa and the Himalayas. Issues span hydrologic / water resources modeling, agricultural productivity, and forest carbon reserves. The scenarios needed for these efforts encompass seasonal forecasts, interannual outlooks, and likely decadal / multi-decadal trends. Providing these scenarios across the different AST efforts enables some level of integration in considering regional responses to climate events.

We will discuss a number of challenges in developing this continuum of scenarios including the identification and “mining” of predictability, addressing multiple continental regions, issues of downscaling global model integrations to regional / local applications (i.e. hydrologic and crop modeling). We compare / contrast the role of the U.S. National Multi-Model Experiment initiative in seasonal forecasts and the CMIP-5 climate model experiments in supporting these efforts. Examples of these scenarios, their use, and an assessment of their utility as well as limitations will be presented.